

Patent claims

1. Nonwoven mat as half-stuff which contains at least one first fibre made of a high performance thermoplast as melt fibre, having a weight proportion of 30 to 90%, and at least one second reinforcing fibre made of a high performance material, the temperature stability of which is greater than that of the melt fibre, having a weight proportion of 10 to 70%, and also 1 to 10 per cent by weight of a binder, the weight proportions being relative to the entire formulation of the nonwoven mat, with the proviso that the fibre length of the melt fibre is smaller than that of the reinforcing fibre.
2. Nonwoven mat according to claim 1, characterised in that the fibre length of the melt fibre and of the reinforcing fibre is in the range of 0.1 mm to 30 mm.
3. Nonwoven mat according to claim 2, characterised in that the length of the melt fibre is 2 mm to 6 mm.
4. Nonwoven mat according to claim 3,

characterised in that the length of the melt fibre is 2.5 mm to 3.5 mm.

5. Nonwoven mat according to claim 2, characterised in that the length of the reinforcing fibre is 6 mm to 18 mm.
6. Nonwoven mat according to claim 5, characterised in that the length of the reinforcing fibre is 6 mm to 12 mm.
7. Nonwoven mat according to one of the claims 1 to 6, characterised in that the melt fibre is selected from polyether etherketone, poly-p-phenylene sulphide, polyether imide and/or polyether sulphone and/or mixtures thereof.
8. Nonwoven mat according to one of the claims 1 to 7, characterised in that the reinforcing fibre is selected from glass fibres, aramide fibres, carbon fibres, ceramic fibres, metal fibres, polyimide fibres, polybenzoxazole fibres and natural fibres and/or mixtures thereof.
9. Nonwoven mat according to one of the claims 1 to 8, characterised in that the binder is selected from compounds which are constructed based on polyacrylate, polyvinyl acetate, polyvinyl alcohol, polyurethane, resins, polyolefins, aromatic polyamides or copolymers thereof or mixtures thereof.
10. Nonwoven mat according to claim 9, characterised in that the binder is selected from filaments, fibrils and/or fibrous binders and the geometry varies with respect to the

length/width/height ratio for each individual parameter in the ratio relative to each other in the range of 1 : 1 to 1 : 100,000.

11. Nonwoven mat according to one of the claims 1 to 10, characterised in that it contains additives in addition.
12. Nonwoven mat according to claim 11, characterised in that the additives are selected from tribological additives, additives made from fibres, filaments, fibrils, pulps, metallic or ceramic powder or organic powder and/or mixtures thereof.
13. Nonwoven mat according to claim 12, characterised in that PTFE fibres or powder, PI fibres, aramide fibres, carbon fibres or powder and/or metal powder are used as additives.
14. Nonwoven mat according to one of the claims 1 to 13, characterised in that the nonwoven mat has a basis weight of 8 to 400 g/m².
15. Nonwoven mat according to at least one of the claims 1 to 14, characterised in that the nonwoven mat has a density of 30 to 500 kg/m³.
16. Nonwoven mat according to one of the claims 1 to 15, characterised in that it has a thickness of 0.1 mm to 4 mm.
17. Nonwoven mat according to at least one of the claims 1 to 16, characterised in that a flat substrate is applied on at least one outer side of the nonwoven mat.

18. Nonwoven mat according to claim 17,
characterised in that a web-shaped structure in the form of a woven fabric, plaited fabric, paper or nonwoven is applied.
19. Nonwoven mat according to at least one of the claims 1 to 18,
characterised in that it is a composite of at least two nonwoven mats.
20. Nonwoven mat according to one of the claims 1 to 19,
characterised in that the melt fibre and reinforcing fibre are present homogeneously distributed in the mat.
21. Nonwoven mat according to at least one of the claims 1 to 19,
characterised in that the melt fibres and reinforcing fibres are present inhomogeneously distributed in the mat.
22. Method for producing a nonwoven mat according to at least one of the claims 1 to 21,
characterised in that the melt fibre and the reinforcing fibre are dispersed in a dispersion agent, preferably water, and in that a continuous nonwoven formation is effected on a wire belt by filtration and subsequently compaction and drying of the nonwoven web is implemented, the binder being added during the dispersion step and/or during the nonwoven formation.
23. Method according to claim 22,
characterised in that implementation takes place with a diagonally running wire.
24. Method according to claim 22 or 23,

characterised in that the binder is added in the form of fibres in a dispersion.

25. Method according to at least one of the claims 22 to 24, characterised in that the additives are introduced in the form of fibres or powders.
26. Method according to claim 25, characterised in that the additives are introduced or sprinkled on during the dispersion step and/or during the nonwoven formation.
27. Method according to at least one of the claims 22 to 26, characterised in that the basis weight and the thickness of the nonwoven is controlled by the material composition of the dispersion and/or the supply speed of the dispersion towards the diagonal wire and/or the transport speed thereof.
28. Method according to at least one of the claims 22 to 27, characterised in that the nonwoven formation is effected with sheet material placed on the diagonal wire.
29. Method according to claim 28, characterised in that a plaited fabric, woven fabric or a nonwoven is used as sheet material.
30. Fibre composite comprising at least one reinforcing fibre and a matrix made of a thermoplast, characterised in that it contains 30% to 90% by weight of a reinforcing fibre selected from high performance materials with a fibre length of 0.1 mm to 30 mm, and in that the reinforcing fibre is

orientated anisotropically in the matrix of the high performance material.

31. Fibre composite according to claim 30, characterised in that the reinforcing fibre is selected from glass fibres, aramide fibres, carbon fibres, ceramic fibres or mixtures thereof.
32. Fibre composite according to claim 30 or 31, characterised in that the matrix comprises high performance thermoplasts, selected from polyether etherketone, poly-p-phenylene sulphide, polyether imide and/or polyether sulphone.
33. Fibre composite according to one of the claims 30 to 32, characterised in that it has a density of 0.25 g/cm³ to 6 g/cm³.
34. Fibre composite according to claim 33, characterised in that the density of the fibre composite is 30 to 100% of the maximum achievable density, which is calculated from the densities of the matrix material and of the reinforcing fibre.
35. Fibre composite according to one of the claims 30 to 34, characterised in that the fibre composite has a functional layer on at least one side of the material.
36. Fibre composite according to one of the claims 30 to 35, characterised in that it has a thickness of 0.01 mm to 1.6 mm.
37. Fibre composite according to one of the claims 30 to 36, which can be produced by compaction of at least two nonwoven mats in a heated tool according to at least one of the claims 1 to 20.

38. Fibre composite according to claim 37,
characterised in that the compaction was produced at a pressure of
0.05 – 15 N/mm².